

CLAIMS

1. A substrate for a semiconductor device, comprising:

a base (1) made of one type of material selected from the group consisting of an alloy including copper and tungsten, an alloy including
5 copper and molybdenum, an alloy including copper, tungsten and molybdenum, a composite material including aluminum and silicon carbide and a composite material including silicon and silicon carbide; and

an electrically insulating film (3) formed on at least a portion of a surface of said base (1), wherein

10 said electrically insulating film (3) includes plural layers made of at least one type of film selected from the group consisting of a diamond-like carbon film, an aluminum oxide film and a silicon oxide film.

2. The substrate for a semiconductor device according to Claim 1,
15 wherein the thickness of said electrically insulating film (3) is no smaller than the surface roughness of said base (1).

3. The substrate for a semiconductor device according to Claim 2,
wherein the surface roughness R_{max} of said base (1) is no smaller than 0.1
20 μm and no greater than 20 μm .

4. The substrate for a semiconductor device according to Claim 1,
wherein the depth of a defective portion is no greater than 2/3 of the thickness of said electrically insulating film (3).

5. The substrate for a semiconductor device according to Claim 1, wherein said electrically insulating film (3) is formed on the surface of said base (1) on which a semiconductor element (5) is to be mounted.

5 6. The substrate for a semiconductor device according to Claim 1, wherein said alloy including copper and tungsten, said alloy including copper and molybdenum, and said alloy including copper, tungsten and molybdenum include no less than 5 mass % and no more than 40 mass % of copper.

10 7. The substrate for a semiconductor device according to Claim 1, wherein said composite material including aluminum and silicon carbide includes no less than 20 mass % and no more than 90 mass % of aluminum.

15 8. The substrate for a semiconductor device according to Claim 1, wherein said composite material including silicon and silicon carbide includes no less than 10 mass % and no more than 35 mass % of silicon.

 9. A semiconductor device, comprising:

20 a base (1) made of one type of material selected from the group consisting of an alloy including copper and tungsten, an alloy including copper and molybdenum, an alloy including copper, tungsten and molybdenum, a composite material including aluminum and silicon carbide and a composite material including silicon and silicon carbide;

25 an electrically insulating film (3) formed on at least a portion of a

surface of said base (1); and

a semiconductor element (5) bonded to the top of said electrically insulating film (3), wherein

said electrically insulating film (3) includes plural layers made of at least one type of film selected from the group consisting of a diamond-like carbon film, an aluminum oxide film and a silicon oxide film.